**Water pollutants**

1. **Use the information on the next page to fill out the table. You will be able to use the chart on your test. Be as specific as possible in your chart, but there is no need to use numbers.**
2. **Use your chart and the clues to determine the source of the pollution. There than may be more than one.**

[**http://www.umich.edu/~gs265/society/waterpollution.htm**](http://www.umich.edu/~gs265/society/waterpollution.htm) **edited by A. Flarend**

**POINT AND NONPOINT SOURCES**

Two types of water pollutants exist; point source and nonpoint source.  Point sources of pollution occur when harmful substances are emitted directly into a body of water.  The Exxon Valdez oil spill best illustrates a point source water pollution.  **A nonpoint source** delivers pollutants indirectly through environmental changes.  An example of this type of water pollution is when fertilizer from a field is carried into a stream by rain, in the form of run-off which in turn effects aquatic life.  Nonpoint sources are much more difficult to control.  Pollution arising from nonpoint sources accounts for a majority of the contaminants in streams and lakes.

**CAUSES OF POLLUTION**

     Many causes of pollution including sewage and fertilizers contain nutrients such as nitrates and phosphates.  In excess levels, nutrients over stimulate the growth of aquatic plants and algae.  Excessive growth of these types of organisms consequently clogs our waterways, use up dissolved oxygen as they decompose, and block light to deeper waters. This, in turn, proves very harmful to aquatic organisms as it affects the respiration ability or fish and other invertebrates that reside in water.

     Pollution is also caused when silt and other suspended solids, such as soil, washoff plowed fields, construction and logging sites, urban areas, and eroded river banks when it rains.  Under natural conditions, lakes, rivers, and other water bodies undergo an aging process that slowly fills in the water body with sediment and organic matter.  When these sediments enter various bodies of water, fish respiration becomes impaired, plant productivity and water depth become reduced, and aquatic organisms and their environments become suffocated.

Pollution in the form of organic material enters waterways in many different forms as sewage, as leaves and grass clippings, or as runoff from livestock feedlots and pastures.  When natural bacteria in the water break down this organic material, they begin to use up the oxygen dissolved in the water. This is measured by Biological Demand for Oxygen (BOD). More bacteria need more oxygen, leading to a higher BOD measurement which indicates a probability of lower amounts of oxygen in the water. Many types of fish and bottom-dwelling animals cannot survive when levels of dissolved oxygen drop below two to five parts per million.  When this occurs, it kills aquatic organisms in large numbers which leads to disruptions in the food chain.

Inorganic pollutants that are a concern are metals released from coal power plants and industrial processes. These are poisons that interfere with brain function, reproduction and can even cause death in large enough doses. Inorganic pollutants include the SOx and NOx that are released from coal mining and burning to form acid precipitation and acid mine drainage. Acidic conditions help make toxic metals available to life forms as well as interfere with reproduction.

     Pathogens are another type of pollution that prove very harmful.  They can cause many illnesses that range from typhoid and dysentery to minor respiratory and skin diseases.  Pathogens include such organisms as bacteria, viruses, and protozoan.  These pollutants enter waterways through untreated sewage, storm drains, septic tanks, runoff from farms, and particularly boats that dump sewage.  Though microscopic, these pollutants have a tremendous effect evidenced by their ability to cause sickness.

Petroleum often pollutes waterbodies in the form of oil, resulting from oil spills.  The previously mentioned Exxon Valdez is an example of this type of water pollution.  These large-scale accidental discharges of petroleum are an important cause of pollution along shore lines.  Besides the supertankers, off-shore drilling operations contribute a large share of pollution.

Heat is a pollutant because increased temperatures lead to lower levels of oxygen which can result in the deaths of many aquatic organisms.  These changes in temperatures are caused by discharge of cooling water by factories and power plants.